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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/436,062	11/08/1999	CRAIG W. WARNER	10991087-1	6095

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EXAMINER
FERRIS, DERRICK W

ART UNIT	PAPER NUMBER
2663	7

DATE MAILED: 05/27/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)
	09/436,062	WARNER, CRAIG W.
	Examiner	Art Unit
	Derrick W. Ferris	2663

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *24 March 2003* .

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-25* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-25* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *08 November 1999* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Response to Amendment

1. **Claims 1-25** as amended are still in consideration for this application. Applicant has added claims 16-25.

2. Examiner does **not withdraw** the obviousness rejection to *Galles et al.* for Office action filed 12/31/02 in reference to line item 1-2. Examiner thanks applicant for highlighting the claimed limitations at issue for the claims. In general, it appears there are two limitations at issue. The first is "source logic in the source node to identify a data route from the source node to the destination node through the at least one intermediate node". *Galles et al.* teaches the preceding step of using "explorer" packets to determine a network configuration (i.e., each tier is mapped out, one tier at a time). From these explorer frames, a route from source to destination can be determined using "source logic" through routing vectors. Specifically, *Galles et al.* discloses using a vector packet for routing a packet which contains each port needed for routing a packet before the packet is communicated as shown in figures 13-14 (emphasis column 16, lines 25-43). Thus the data route is specified by at least one destination port value. More at issue, is the second issue of the second limitation which in general recites: "the data route being specified by a sequence of at least one destination port value and a current hop count that are attached to a data packet". Specifically at issue is a "current hop count" which examiner notes is either inherently taught or obvious in view of *Galles et al.* Examiner also notes the new claims (especially claim 16) better recite the limitation and purpose of a "current hop count" (e.g., to avoid a table look-up). Examiner emphasizes page 12, lines 11-19 of applicant's specification (and applicant's figure 4) which points out that applicant's current hop count points to a

particular destination port value; however, the inter-relationship is not recited in the claims (i.e., that the hop count is used as an index is not recited in the claims). Shown in figure 17 of *Galles et al.* is a termination value which points to a particular port value in the vector field [column 18, lines 6-60]. Examiner notes that removing the previous vector and shifting subsequent vector field one place forward [column 18, lines 26-27] either inherently or makes obvious a general functionality of providing a pointer to a particular destination port value using a reasonable but broad interpretation (i.e., by looking at example in figure 17 the hop count is determined based on the order/cycle of vectors). Thus Galles et al. provides a motivation.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. **Claims 1-23** are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No., 5,721,819 to Galles et al. ("*Galles*").

As to **claims 1, 6, 11 and 16**, *Galles* discloses a programmable distributed routing system and method using routing tables for a network in general, and more specifically towards a multi-processor environment [column 1, lines 16-24]. As applicant's invention is also directed towards routing in a multi-processor environment, examiner notes a strong motivation for using the subject matter as a whole for the reference. Using the example shown in figures 16 and 17, examiner notes *Galles* discloses a number of nodes such as a source node (e.g., an originating device 1604), an intermediate node (e.g.,

router 204c), and a destination node (e.g., target device 1608) [column 18, lines 1-60]. Examiner notes that *Galles* discloses in general using a broad but reasonable interpretation source logic, routing logic, and destination logic (also referred to as path identification means, routing means and destination means) to identify, transmit, route, and detect respectively.

Not clearly shown in the reference is a current hop count with respect to the source logic used to identify a route from source node to destination node that is attached to a data packet to be transmitted. Examiner notes that it would have been either inherent or obvious to a skilled artisan prior to applicant's invention, given the teachings *Galles*, to disclose such a hop count in general. Examiner notes that the motivation provided by *Galles* is to keep track of a packet through the network. Examiner directs applicant's attention to figure 17, which indirectly shows the vector fields through each hop along the path to the destination node. For example, the route to the destination must travel through egress ports 2 (for router 204a), 1(for router 204c), 3(for router 204b), and 2 (for router 204e) respectively. Examiner notes that this path has a hop count of four routers (i.e., routers 204a, 204c, 204b, and 204e). Furthermore, examiner notes this hop count is indirectly decremented through the vector packet configuration through each hop to the destination node.

As to **claims 2 and 7**, examiner notes this example also shows a return route path [column 18, lines 62-67; column 19, lines 1-25]. Noted specifically is the source port stored in the vector packet configuration. Examiner also notes a total hop count is shown (see reasoning in rejection for claim 1).

As to **claims 3 and 8**, *Galles* discloses a routing table for each router (including a source node).

As to **claims 4 and 9**, examiner notes the reasoning behind the rejection for claim 1 shows that it would have been obvious to a skilled artisan to decrement the hop count (indirectly).

As to **claims 5 and 10**, *Galles* broadly discloses replacing the destination port with the source port of the intermediate node.

As to **claim 12**, again as mentioned in the rejection for claim 12, it would have been obvious to a skilled artisan prior to applicant's invention to include a total hops value (i.e., same motivation applies). *Galles* also broadly discloses recording at least one source port value in the data packet (for the return path).

As to **claim 13**, *Galles* discloses at least one routing path between source and destination node.

As to **claim 14**, examiner notes that it would have been obvious to a skilled artisan prior to applicant's invention to decrement the current hop count (see the reasoning behind the rejection for claim 11 in that the same motivation applies).

As to **claim 15**, see the reasoning behind the rejection for claim 13. Again, *Galles* broadly discloses an act of replacing.

As to **claim 17**, figure 17 clearly shows when a packet has arrived at the destination node (i.e., target device 1608).

As to **claim 18**, since the vector port values are already predetermined by the vector fields 1312 in the vector packet (see 13), little or no table lookups are needed.

Thus using a reasonable but broad interpretation of the claimed subject matter table look-ups are avoided since the egress port number is already stored as a vector in the vector field 1312 for the purpose of routing [column 16, lines 65-67]. In other words, the same reasoning is applied as noted by applicant in applicant's specification on page 4, lines 8-10 with respect to "routing table lookups" at intermediate nodes. Specifically that routing tables looks are not required at intermediate nodes as the destination port value for each for each node is located in the header of the packet to be routed. Thus as mentioned above, *Galles* discloses using the destination port value for each node such that routing may not be required (i.e., it may be optional).

As to **claim 19**, examiner notes that a header 1304 can further contain a source port value (i.e., ingress port) for the purpose of re-routing [column 18, lines 34-37].

As to **claims 20-23**, as shown in figure 17, the receipt may be acknowledged using the alterative embodiment by swapping the destination and source port values using a reasonable but broad interpretation of "swapping". Examiner notes that the same reasoning also applies with respect to hop count as mentioned in the rejection for claim 1. Examiner also notes that the return routing is performed independently of the routing table [column 18, lines 61-67; column 19, lines 1-25].

5. **Claims 24-25** are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No., 5,721,819 to Galles et al. ("*Galles*") in further view of "A Queuing Model for Wormhole Routing with Timeout" to *Hu et al.* ("*Hu*")

As to **claim 24**, *Galles* is silent or deficient to checking for a time-out value in general. Examiner notes that it would have been obvious to a skilled artisan prior to

applicant's invention to use a time-out value in general to avoid deadlock problems in a multiprocessor network. As further support, *Hu* discloses using a time-out to avoid deadlock [page 585].

As to **claim 25**, *Hu* is silent or deficient to the type of routing algorithm employed (i.e., the routing strategy is not specified) [page 585] such that it would have been obvious to a skilled artisan to use a routing algorithm to avoid deadlock free routing. *Galles* discloses performing deadlock free routing [column 2, lines 4-5] such that routing tables can be reprogrammed to account for changes in the network configuration such as deadlock.

As both reference disclose network computing in general, and more specifically routing packets in a multi-processor environment, examiner notes a strong motivation to combine the subject matter as a whole.

Conclusion

6. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event,

however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Derrick W. Ferris whose telephone number is (703) 305-4225. The examiner can normally be reached on M-F 9 A.M. - 4:30 P.M. E.S.T.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chau Nguyen can be reached on (703) 308-5340. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9314 for regular communications and (703) 872-9314 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 305-3900.

Derrick W. Ferris
Examiner
Art Unit 2663

DWF
May 19, 2003

MELVIN MARCELO
PRIMARY EXAMINER